X-3D-BL User's Manual

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1 Introduction

Congratulations! You have just bought a powerful high-end model aircraft kit!

Please read this manual thoroughly until the end **before** you start assembling your X-3D-BL and stick with the proposed chronological order. Warranty is void if this manual is not strictly followed.

WARNING!

Assembling the X-3D-BL requires some experience with building R/C models and soldering. If you do not feel like you could do this on your own, please make sure you get some help from a person with the experience required. If cables are connected falsely hardware can be destroyed. WARNING! Such cases are not covered by warranty!

A motorized model aircraft is not a toy! It should only be flown by adults. Improper assembly or operating can lead to severe injuries and / or damages. Trouble with your remote control due to interferences can occur any time without prior notice. Sometimes, a model aircraft can suddenly become uncontrollable due to a failure of any component, including mechanical parts and electronics. In this case, the model can rapidly move towards any direction. Make sure you always keep a safe distance to people, animals, obstacles or things of any kind, traffic roads, etc.. There are country-specific laws regulating the operation of model aircrafts that definitely have to be obeyed. Furthermore, we strongly recommend to effect a liability insurance for model aircrafts. The manufacturer and your dealer of the X-3D-BL do not have any influence on, nor can they monitor the correct assembly and proper operation of your model aircraft. Always be aware of the dangers mentioned above and act accordingly. There is no liability of the manufacturer nor the retailer at all, as far as legally approved.

Our products are hobby-products and solely meant for usage in non-commercial ways. It is not allowed to use them for any commercial or military purposes. Using any of our components for larger scale flying objects is explicitly forbidden.

SUBJECT TO CHANGE WITHOUT NOTICE.

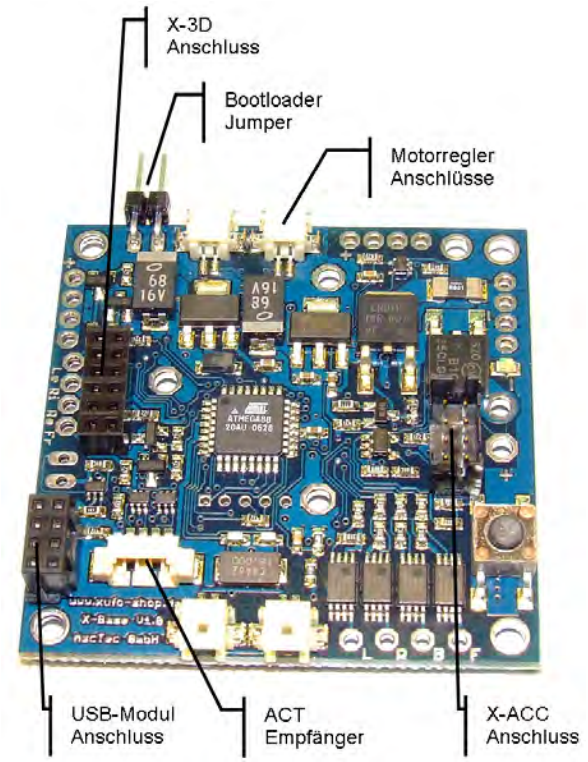
1.1 System overview

1.1.1 X-CSM

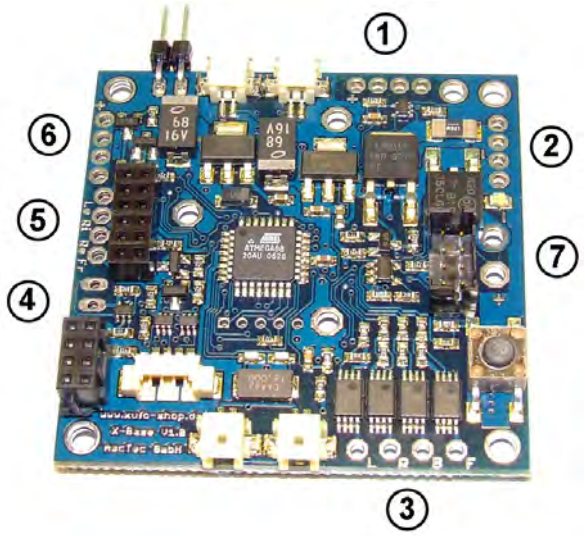
The X-CSM is the mechanical frame of the X-3D-BL UFO. The booms, which are made of a rigid carbon fiber-balsa wood sandwich material, can be replaced individually. The central unit of the frame called the "X-CSM Core" is made of light weight laser-cut magnesium parts. Being built out of these state-of-the-art materials the X-CSM is a very robust high-tech basis for your quadrotor aircraft.

1.1.2 X-Base

The X-Base is the central control unit which is connected to and communicates with all active elements of the X-3D-BL. Next to the battery, the motor controllers, the X-3D gyro and the receiver you can also connect several LEDs to the X-Base to give your X-3D-BL a unique fancy look.



An LED connected to the "Front-LED" Pads on the bottom side of the X-Base will always be on as long as the X-3D-BL is turned on. Such an LED can be mounted to the very front of your vehicle to make it easier for the pilot to know where the front side is.



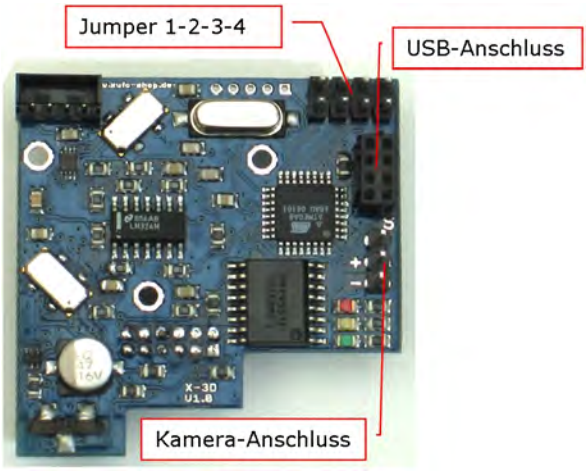
1 BL-controllers / brushed motors (+)
2 BL-controllers (-)
3 Brushed motors (-) **L**eft/**R**ight/**B**ack/**F**ront
4 PPM-Receiver Input (-) (+) Signal (from lower to upper connector)
5 LEDs (-) **Le**ft/**Ri**ght/**Re**ar/**Fr**ont
6 LEDs (+) 5V
7 Power connector, (+) and (-) marked on the upper side of the board

The key below the power connector (7) turns the X-3D-BL on and off. A short press is enough to turn the vehicle on. To turn it off the key has to be pressed for at least 200ms.

The "brushed motors" connectors of the X-Base (3) are not required as the brushless motors are driven by independent controllers, and thus the connectors can be used to drive peripherals like for instance a night-flight kit. Connector "L" is switched on and off by R/C channel 5, connector "R" by R/C channel 6. The connectors can sink currents up to 5A if they're enabled. That means that the (-)-input of a peripheral has to be connected to the "L" or "R" pad and the (+)-input has to be connected to (+) (connector (1)). Be aware that in this configuration your peripheral will be supplied the whole battery voltage. If this not what you need make sure you use a suitable voltage regulator.

1.1.3 X-3D

The X-3D is the sensor unit of the X-3D-BL. With three piezo-gyros and highly optimized control loops it does the actual flight/attitude control. All parameters influencing the in-flight behavior can be tuned by connecting the X-3D to a PC using the USB adapter that came with your X-3D-BL. Once you are on the field for flying you can select four different parameter sets using two jumpers.

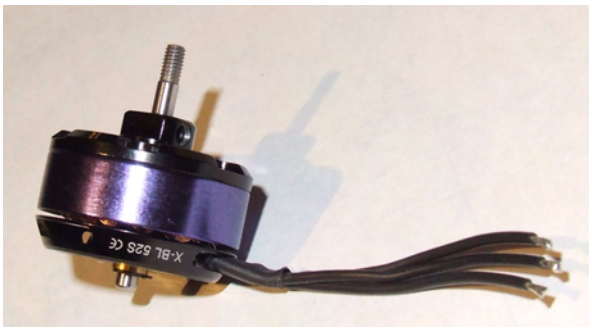


LED patterns shown by the X-3D

- **red blinking:** Initializing or at least one motor not detected
- **yellow+green:** No reception or playing startup-melody
- **green:** Ready to fly

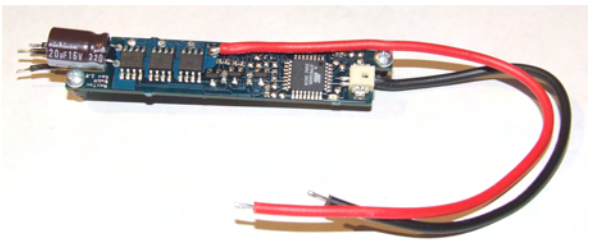
1.1.4 Motors

The X-BL-52s motors by HACKER Motors Germany are custom-built for the X-3D-BL. The motors are perfectly suited for the application in this vehicle.



1.1.5 X-BLDC brushless motor controller

Every motor is controlled by an independent X-BLDC brushless motor controller. The controllers are highly optimized for the X-BL-52s motors and thus ensure the highest efficiency possible. Please note that for this reason the controllers might not work with a different motor type.



1.2 Components required for the X-3D-BL

1.2.1 Part list

X-CSM

* 1 sheet of magnesium with pre-cut parts to quarry out
* 4 CF/balsa wood sandwich material booms
* 4 CF panels (1 big, 3 small ones)
* 10 plastic screws incl. nuts
* 1 GFK antenna stick
* 4 O-rings
* 4 rubber bushings
* 1 silicon tube

X-Base

* 1 X-Base
* 1 ACT receiver incl. cable
* 4 spacers (6 mm)
* 4 tapping screws

X-3D

* 1 X-3D
* 3 spacers
* 6 M2-screws
* 2 jumpers

BL-Kit

* 4 X-BLDC motor controllers
* 4 X-BL-52s motors
* 4 I2C cables
* 8 spacers
* 8 tapping screws
* 2 propellers (clockwise rotation)
* 2 propellers (counter clockwise rotation)
* 4 nuts
* 16 plastic screws (short)

1.2.2 Additionally required

Material

* foam to protect the battery
* optionally 4 cable ties 2,5 x 100 mm

Adhesion

* Super Glue
* double sided tape

Tools

* screwdrivers (+ and -)
* soldering iron
* lighter or hot-air-gun

2 Assembly

2.1 Before you start

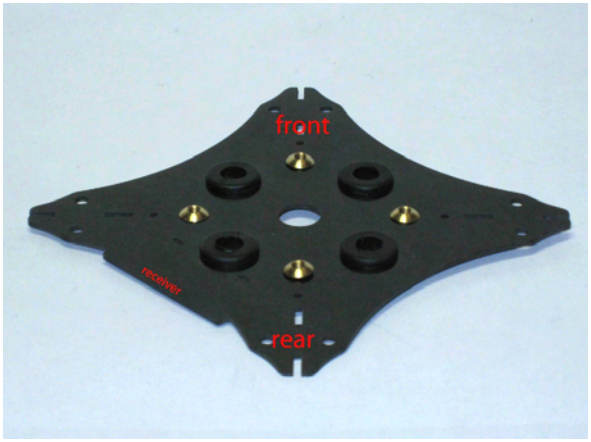
Familiarize yourself with the kit and check if all parts are included. All parts are subject to quality assurance during production and packaging. We hope that you are contented with the quality of all components. If a part should not be totally o.k. we are willing to amend or exchange the affected part.

2.2 Assembly of the X-CSM frame

The whole assembly process of the X-CSM is described below. Every important step is depicted in a photograph. Please read the whole section before you start assembling your frame in the recommended order.

2.2.1 Preparing the base of the X-CSM Core

Press the rubber bushings in the respective holes and glue in the brazen bushings using for example Super Glue.



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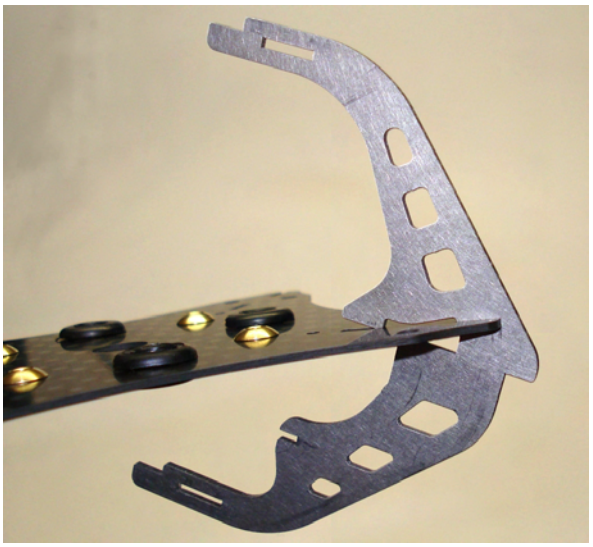
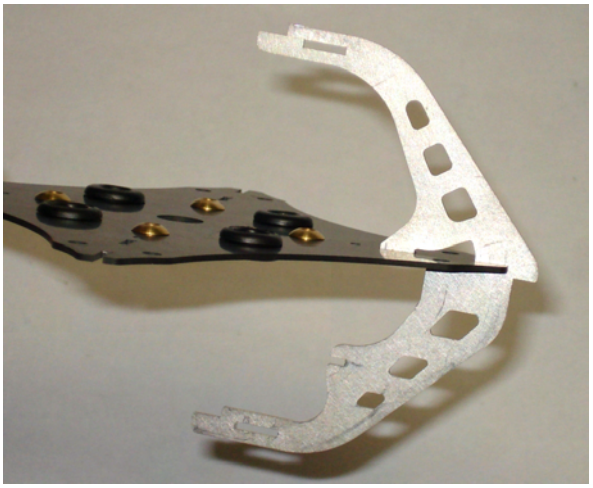
2.2.2 Lateral frame parts of the X-CSM Core

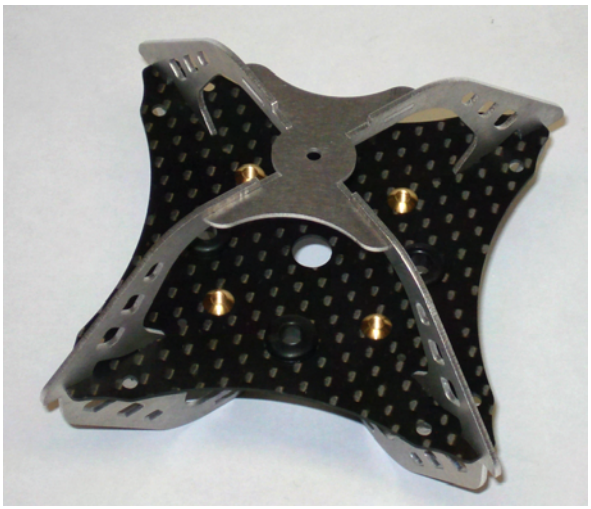


Plug the lateral magnesium parts into the planned slots. Turn them until they engage.



2.2.3 Upper side of the core

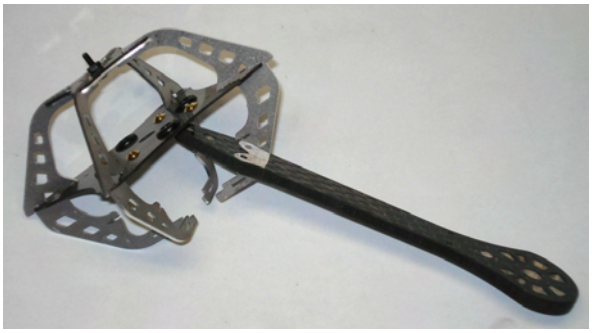
Plug one of the two magnesium plates into the slots inside the lateral magnesium parts on the upper side of the core. In this case, orientation does not matter.



Press one of the small CF plates from above over the lateral parts, until the CF plate touches the magnesium plate completely. Slide a plastic screw through the central hole and fix it using a plastic nut.

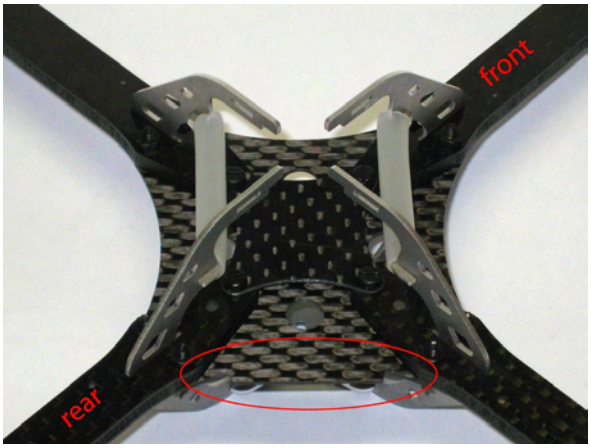
2.2.4 Adding the booms

Plug the booms onto the lateral parts of the Core from below and slide them up. If a lot of force is required to do so, it is very likely that upper and lower side of the booms have been confused. Marking: The drill holes to attach the motor controllers are on the lower side of the booms.



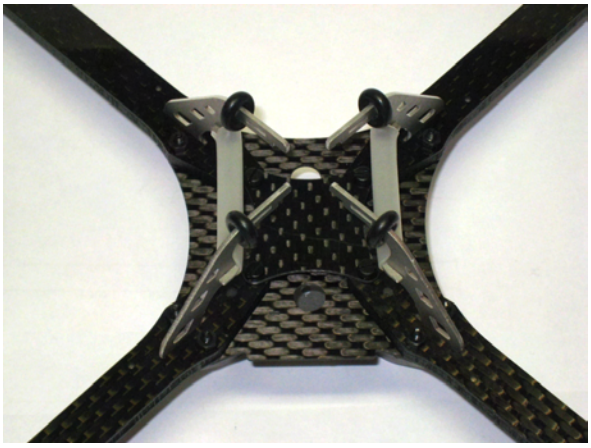
After that, the booms have to be secured with two plastic screws each. The screws go into the outer two ho-

les from top and are fixed with plastic nuts from below. Attention! One side of the CF baseboard is meant for mounting the R/C receiver. Please make sure that the orientation is as seen in the following photograph. The R/C receiver goes on the rear left side of the frame (top view!).
Put the solid CF plate on the booms and fix it with four plastic screws which go into the previously mounted brazen bushings.

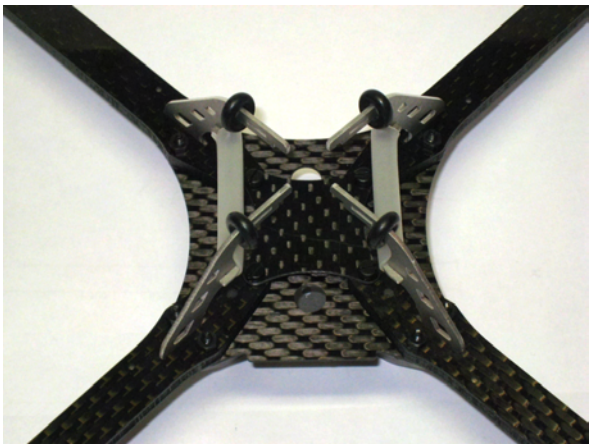


2.2.5 Lower side of the Core

As seen in the picture, the two magnesium bars have to be covered by heat-shrink, a silicon hose, rubber or something similar to protect the battery. Their orientation has to be perpendicular to the R/C receiver mount.

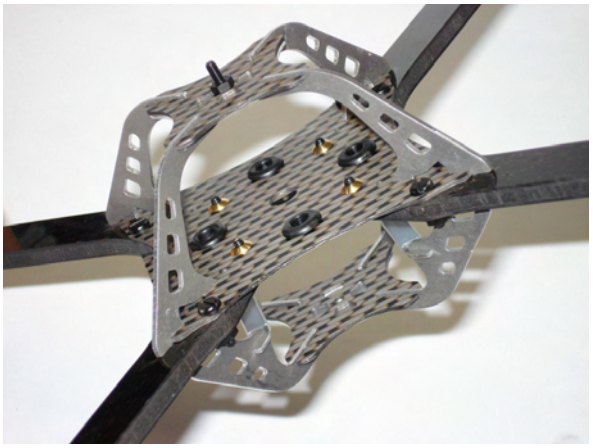


Slide the O-rings over the lateral magnesium parts as seen in the picture.

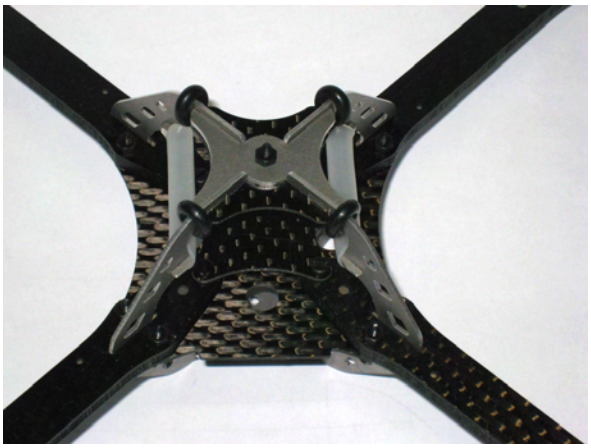


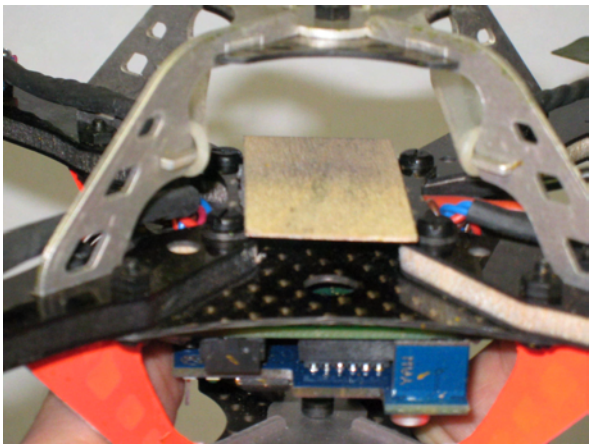
After that, the second magnesium plate is to be placed in the lower slots of the lateral parts. The orientation has to be as seen in the following photograph.

The second CF plate with slots in its corners has to be slid over the lateral parts until it touches the magnesium plate completely.



The two plates are now mounted together using a plastic screw and a plastic nut.



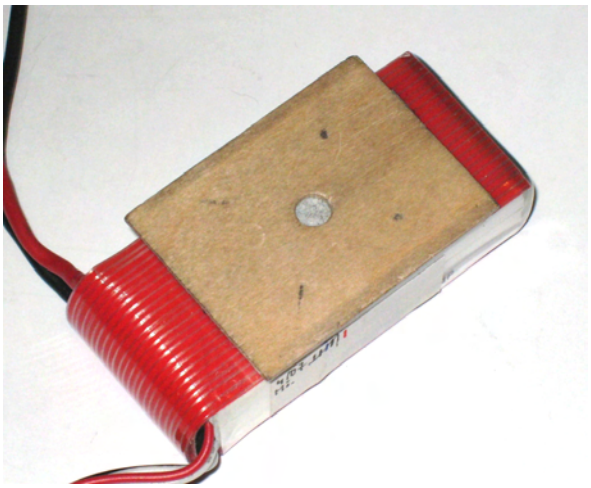


Congratulations! You have just finished your X-CSM Core!

Your X-CSM frame is now assembled completely! Good luck with adding the electronics! :-)

2.2.6 Mounting a battery

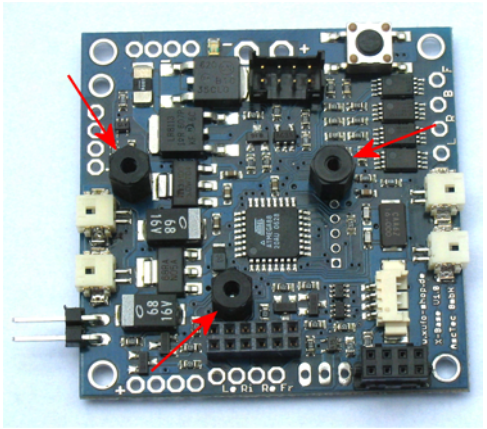
The X-CSM Core offers a good protection for your battery. However, the protection only works if the battery is attached correctly. If this is not the case, the battery can be damaged or even destroyed during a hard crash. The battery can be mounted correctly using for example a small wooden plate with a hole in its center. Such a plate can be attached to the battery using hook-and-loop tape. The hole will engage with the plastic screw in the center of the Core's bottom. Make sure you add some material (e.g. rubber-tape) to push the battery against the bottom of the Core. It is important, that the wooden plate touches the lateral parts of the core, such that the battery can not move sideways.



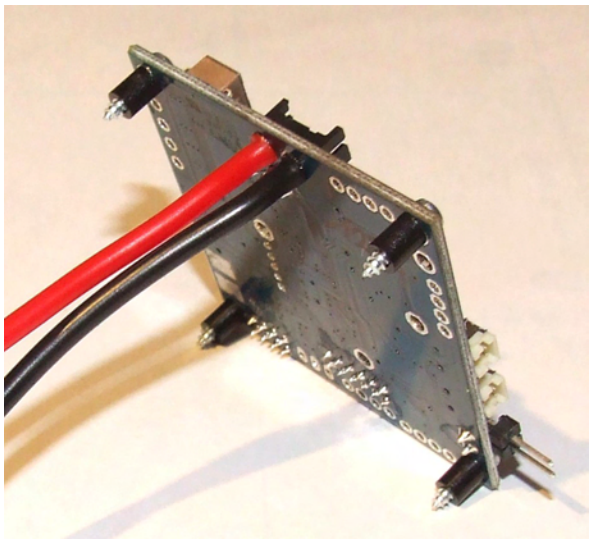
2.3 Mounting the Electronics

2.3.1 Preparing the X-Base

The X-3D spacers have to be screwed to the X-Base.

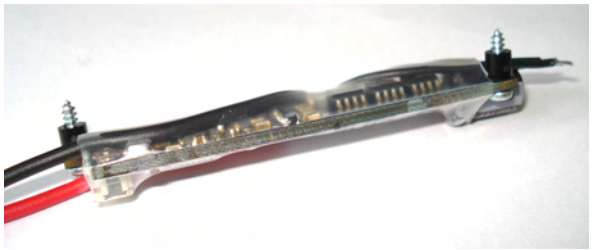


After that, the spacers for mounting the X-Base itself have to be fastened using four tapping screws. The spacers will stick to the screws, even though they can easily be moved up and down.
In addition, the battery cables have to be soldered to the appropriate soldering pads. Make sure that the polarity is correct!



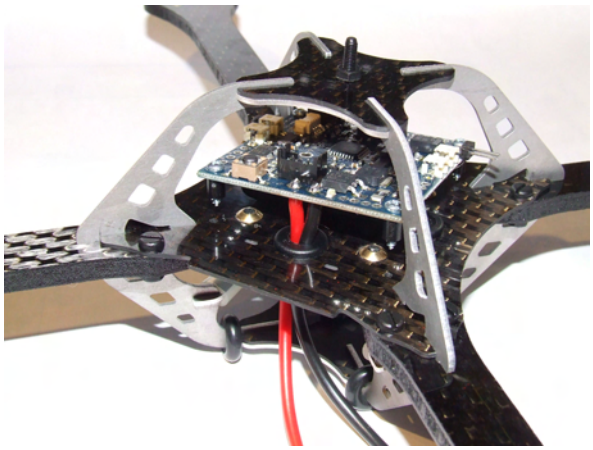
2.3.2 Preparing the X-BLDC motor controllers

Put two tapping screws into the holes and fasten them using the 4 mm plastic spacers. Make sure the screw-heads are at the controller's side with the red cable attached. Repeat this procedure with all four controllers.



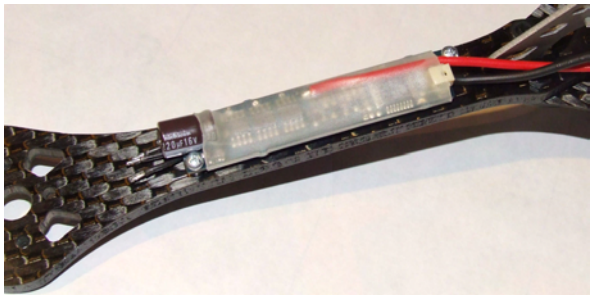
2.3.3 Positioning of the X-Base

Put the battery cables through the rubber bushing next to the receiver-mount. This will be the rear left side of your X-3D-BL.

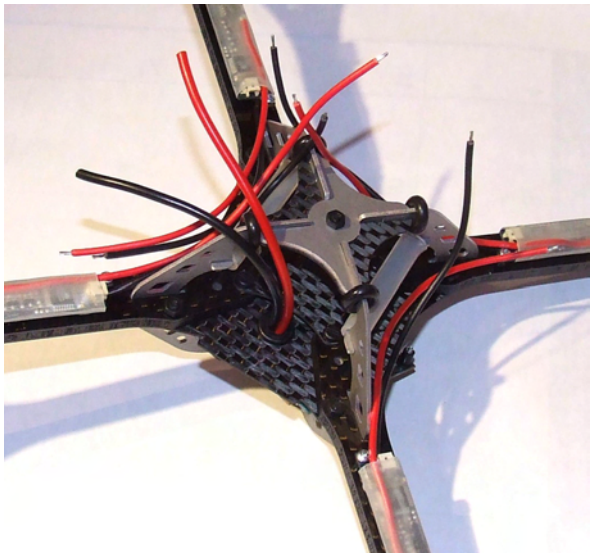


2.3.4 Mounting the X-BLDC motor controllers

Screw the motor controllers to the respective holes in the booms. Do this by turning the screws alternately turn by turn, until the spacers touch the boom. Thus you will not bend the controller boards too much.

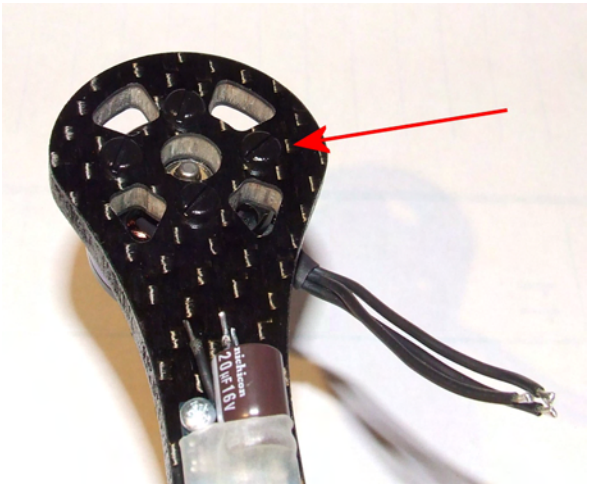


The power cables of the controllers are still unconnected at this point.



2.3.5 Mounting the motors

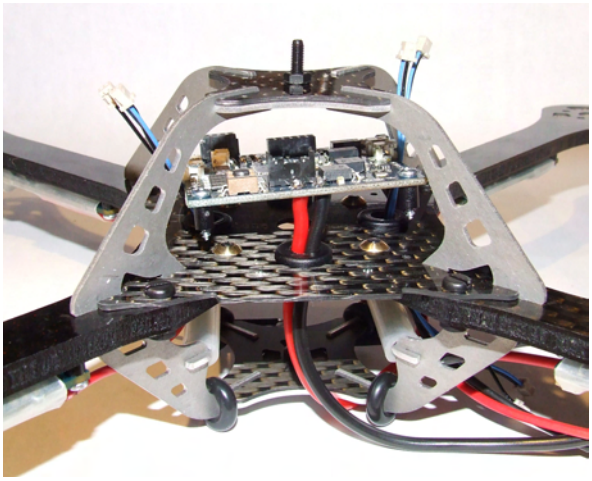
Place the motors on top of the booms as seen in the following picture, and fasten them using 4 plastic screws for each motor. Make sure you use the 8 mm screws which came with the motors, and not the longer ones used for the X-CSM.



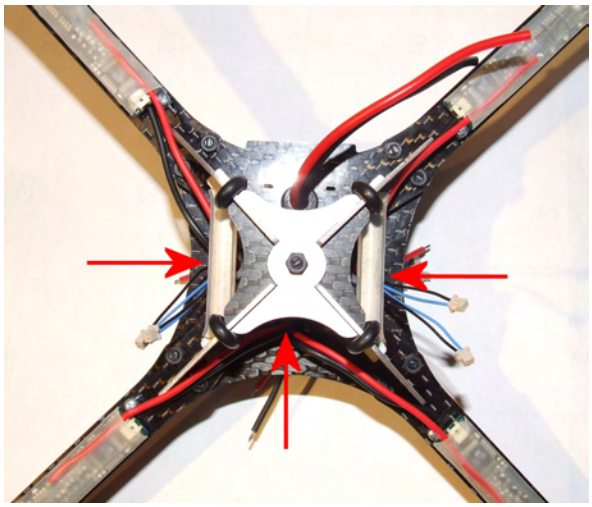
Slide a piece of heat-shrink (about 1 cm) over each motor cable. Therefore you have to cut the heat-shrink which came with your motors and controllers into 12 pieces with about the same length. Solder the motor- and controller cables together and isolate them using the heat-shrink and a hot-air-gun. It does not matter which controller cable you connect to which motor wire, as the turning direction of each motor can be adjusted using the PC-Software later on.

2.3.6 Wiring

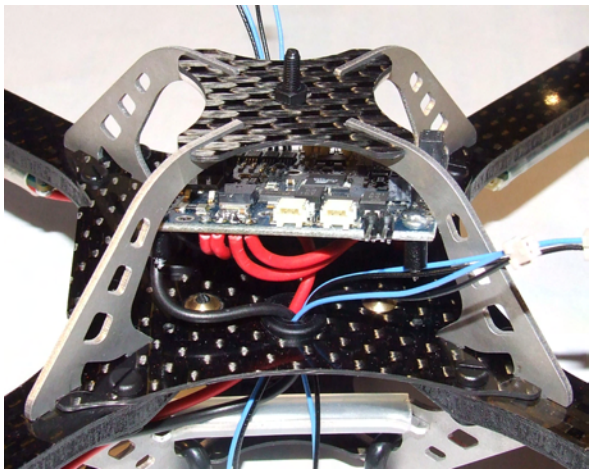
The black and blue data cables (I2C) have to be put through the rubber bushings on the front left and the rear right side of the X-CSM core.



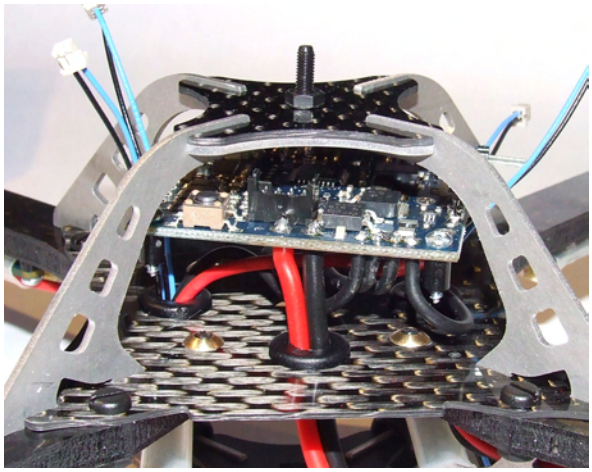
After that, the controller power cables have to be put through the bushings. Two sets of cables go through the so far unused rubber bushing, and one set of cables goes through each of the bushings with the data cables already inside (see photograph).



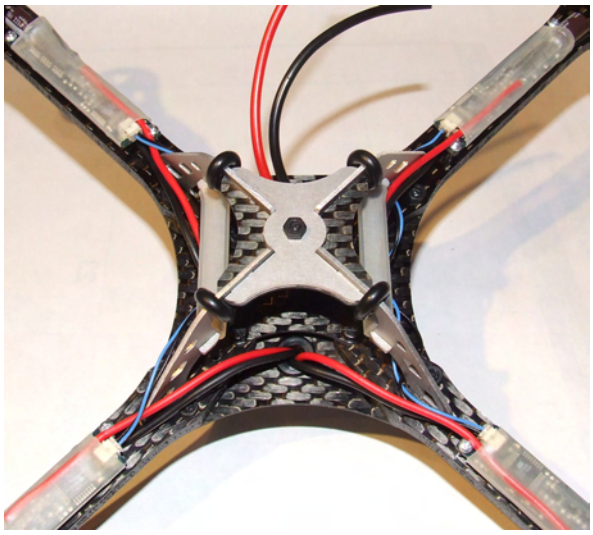
Solder the red cables to the soldering pads at the rear right side of the X-Base marked with "+". The cables' order does not matter. All cables have the same length, which has been chosen such that non of the cables must be shortened nor extended.



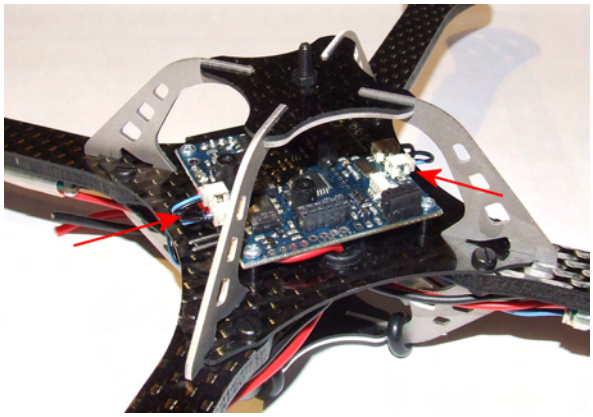
Solder the black cables to the soldering pads marked with "-". Again, their order does not matter. None of the cables has to be shortened nor extended.



Connect the black and blue data cables to the motor controllers ...

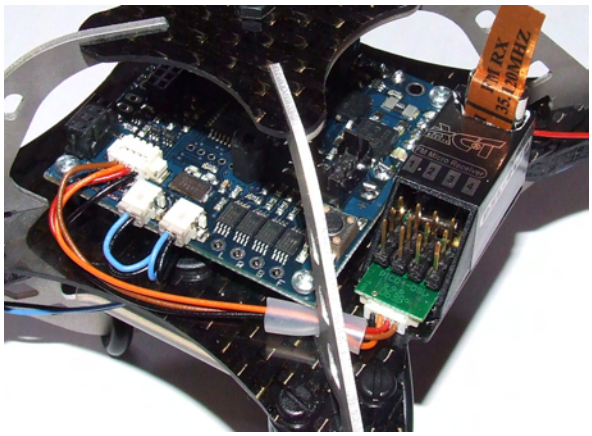


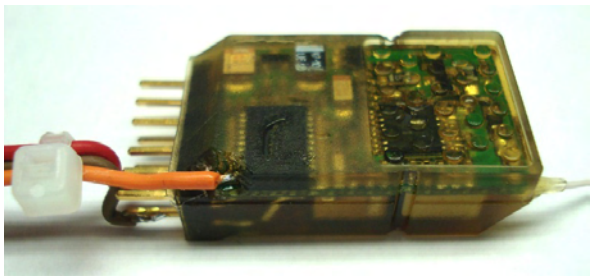
... and to the X-Base.



2.3.7 Mounting the ACT-Receiver (35 or 40 MHz)

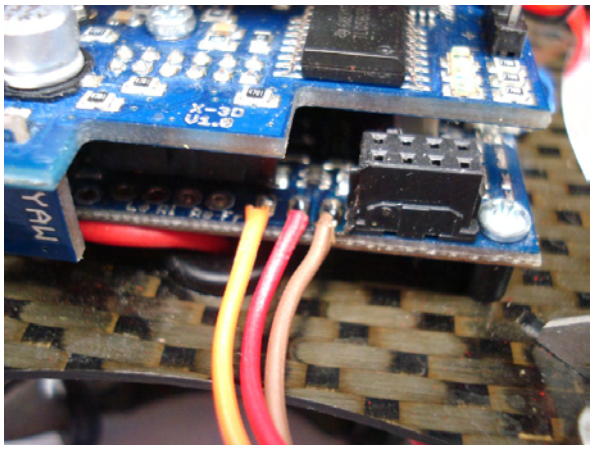
The 4-pin connector for the ACT-Receiver is positioned at the front left side of the X-Base. The receiver is connected using the 4-wire cable. After that, it has to be glued to the receiver mount at the rear left side of your X-CSM using double-sided tape.





Then connect the GND and VCC wires to any of the four GND and VCC connectors:

Finally, connect the cables to connector no. 4 of the X-Base exactly as seen in the next picture.



Please make sure you upload the "X-Base Vx.x for X-BL and PPM receiver.xbs" firmware as described in 3.1.2.

2.3.8 Mounting a different receiver

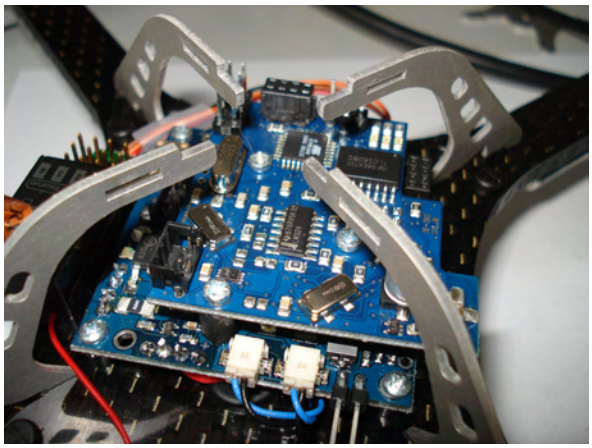
The X-3D-BL was designed for the European market. Unfortunately, ACT-Europe does not offer any 72 MHz receivers with the convenient digital interface used in the X-3D-BL. To enable people in countries, where 35 and 40 MHz R/C models are not allowed, to fly the X-3D-BL as well, we implemented an interface for a standard PPM-receiver (cf. 1.1.2, connector no. 4). However, as a normal receiver has an output multiplexer to distribute the incoming signal to the independent servo control channels, you have to modify the receiver to make it compatible to the X-3D-BL. Be aware that you do such a modification at your own risk! By trying to modify a receiver its warranty will be void!

Almost any receiver can be used, as long as you are able to find and to access the combined PPM-Signal before it is split up into several channels by the output multiplexer. A digital storage oscilloscope is a handy tool to find the signal.

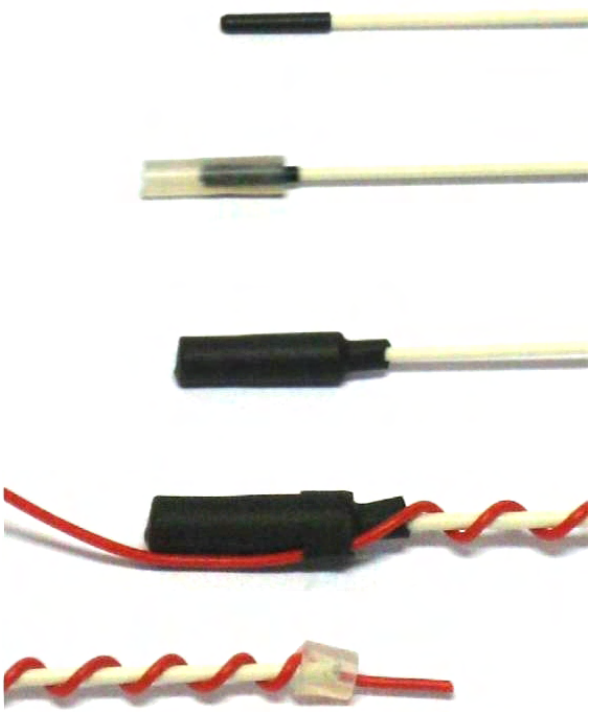
Here is an example of how to modify the "BERG Microstamp 4" full range receiver. This receiver is cast in some soft plastics. The combined PPM signal can be found at the outer most pin of the PIC processor. To reach it you have to use a cutting knife to carefully cut away a little part of the molding material. Carefully solder a wire to the outer most pin of the processor as shown in the following photograph.

2.3.9 Mounting the X-3D

The X-3D is simply plugged to the X-Base and fastened using three screws. To do so, you have to remove the top cover of the X-CSM Core.



There is *no* additional cable required to transfer data between the X-3D and the X-Base. Put the top cover of the X-CSM back in place and fasten it using the central plastic screw.



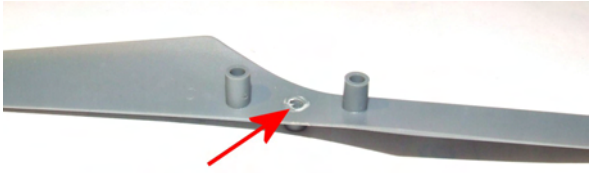
2.4 Last steps

2.4.1 Mounting the antenna

The antenna can be assembled as seen in the following picture. Use the thinnest heat-shrink that came with your kit to cover the lower end of the GFK stick which will hold the antenna wire. Put a silicon hose with a length of about 2 cm over it. Cut a piece of about 3 mm length of the thick heat-shrink and use the remaining (long) piece to cover the silicon hose. Make sure that the heat-shrink covers the upper end of the silicon hose and thus prevents it from sliding off. Fix the antenna wire using a 3 mm piece of the thick heat-shrink and wrap the wire around the stick. The end of the antenna can be fixed to the stick using a short silicon hose. This hose is also used to protect the peak end of the antenna. Now you can simply slide the antenna's stand support over the top-screw of the X-CSM Core. If you want, you can use a metal screw instead of the plastic screw for more stability. Alternatively, the antenna can be put on a longer screw holding one of the booms, or it could be fastened to one of the lateral parts of the X-CSM core using two cable ties.

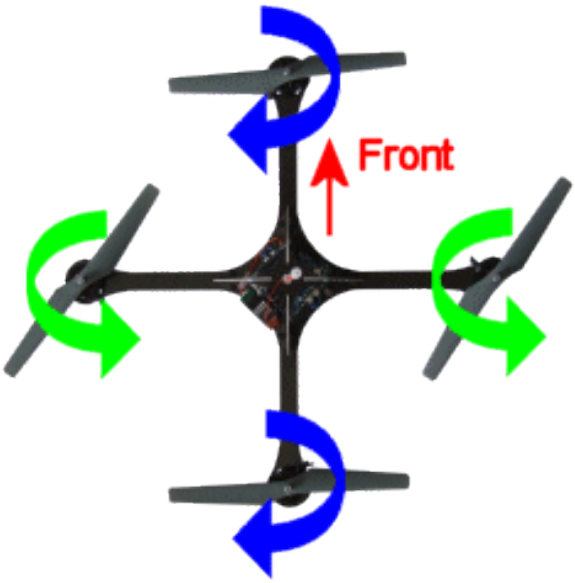
2.4.2 Preparation and mounting of the propellers

The lower piece of the propeller center has to be removed using a cutter. In addition, the hole has to be extended using a 3 mm (1/9 inch) drill.



The propellers can then be slid over the axle and be fastened using a plastic nut. Do not fasten the nut too tight, as this would bend the propellers.

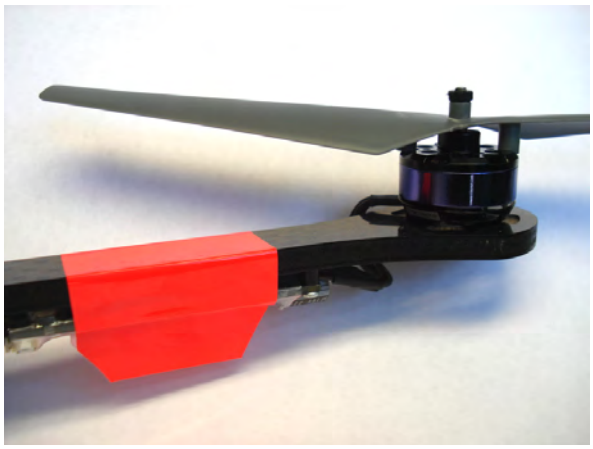
Please note that there are two types of propellers: One pair of propellers is spinning clockwise, the other pair is spinning counterclockwise. The Propellers spinning clockwise must be mounted to the front and the rear motor, whereas the counterclockwise rotating propellers must be mounted to the left and to the right motor.



To improve the durability of the propellers during a crash you can optionally add a cable tie (e.g. 2.5 x 100 mm) as seen in the following picture.

2.4.3 Marking the front

As a pilot you always must know where the front of your X-3D-BL is. To make this easily visible we recommend to attach some colorful tape to the front boom. A little flag as seen in the following photograph makes it much easier to identify the UFOs front in any situation.



3 Setup and configuration of the X-3D-BL

Your X-3D-BL UFO is now completely assembled.

Now, it has to be configured using the X-Control PC software.

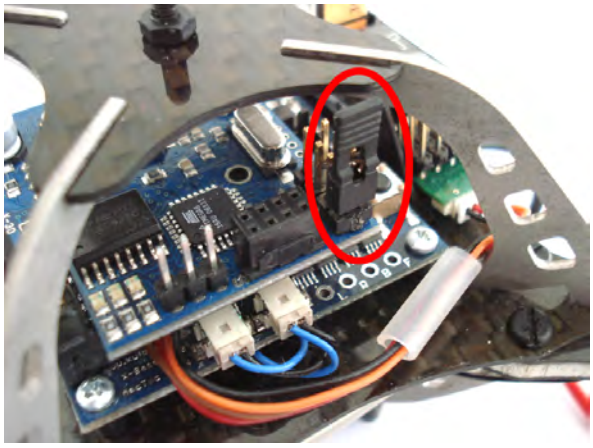
Please download the X-Control PC software from the download area of www.x3d-shop.de. The software package (.zip-file) contains the most recent X-Control software, the on-board-software for all components of the X-3D-BL and optimized parameter sets for the X-3D. Please unzip the archive to a local folder on your hard disk. Double click the .exe-file to install the X-Control software and follow the instructions given by the install wizard. Then open the application (X-Control) and click on the American flag to change the language to English.

3.1 Updating the Onboard-Software

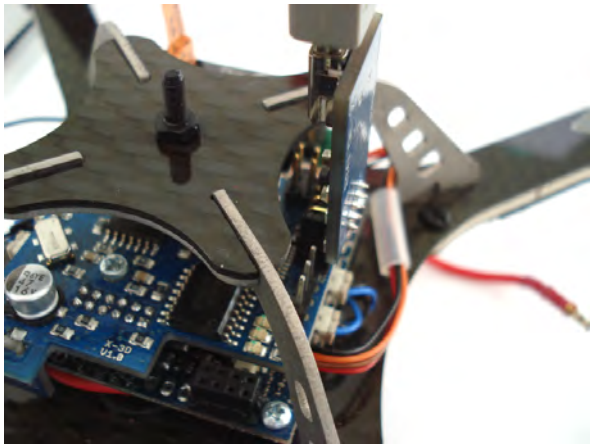
If you bought your X-3D-BL completely in one kit you do not have to update any on-board software. In this case, please continue with chapter 3.2. If for instance you have owned your X-3D or X-Base already before you bought the brushless components, you need to update the on-board software of both, the X-3D and the X-Base as follows.

3.1.1 Software update of the X-3D

Disconnect the battery from the X-3D-BL. You need a jumper to activate the so called bootloader. Set the jumper to the following position:



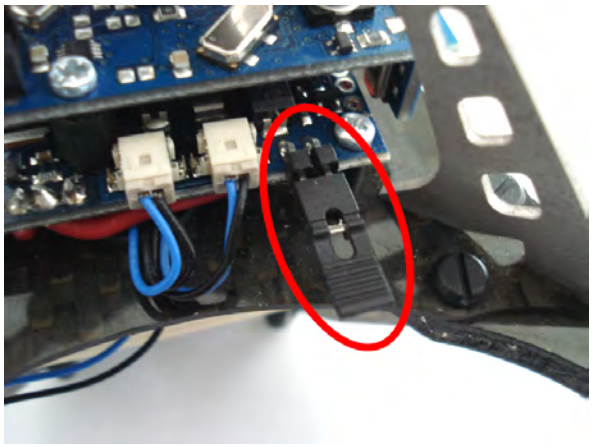
Connect the USB-adapter to your computer. Open the X-Control software, click on "X-3D" and on the left hand side on " X3D firmware upgrade". Then, connect the X-3D to the USB adapter as seen in the following picture.



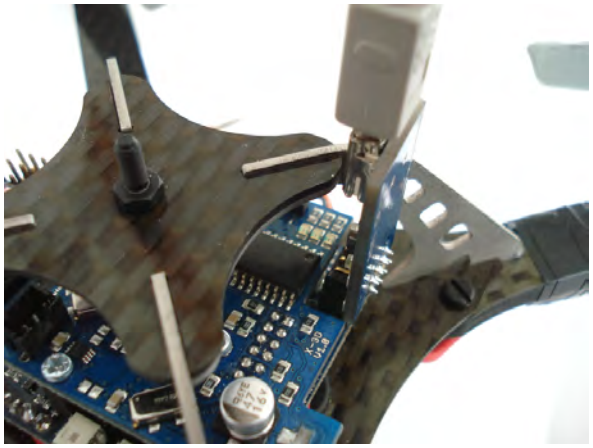
Choose the serial port (normally "Autoselect: COMxx") and click on "connect". Select the "X-3D Vx.x for X-Base.ufc" firmware file after clicking on "select firmware". Then click on "Upload", wait for the upload to be completed, disconnect the USB adapter from the X-3D, remove the bootloader jumper and click on "Finished". The X-3D software update is now completed.

3.1.2 Software update of the X-Base

Again, you need a jumper to activate the so called bootloader. Set the jumper as seen in the following picture.



Open the X-Control software, click on "X-Base" and then on "X-Base firmware Upgrade" on the left hand side. Turn on the X-Base (In this case the battery has to be connected to the UFO!) and connect the USB adapter to the X-Base.



Choose the serial port (normally "Autoselect: COMxx") and click on "connect". Select the "X-Base Vx.x for X-BL and ACT receiver.xbs" firmware file if you are using an ACT receiver (35 or 40 MHz) or select the "X-Base Vx.x for X-BL and PPM receiver.xbs" if you are using a different receiver. Then click on "Upload", wait for the upload to be completed, disconnect the USB adapter from the X-Base, remove the bootloader jumper and click on "Finished". The X-Base software update is now completed.

WARNING! The current limit of the X-Base was set to 11 A in early revisions, to guarantee the full safety in combination with brushed motors. Please make sure that the current limit of your X-Base is set to 35 A as you are using brushless motors. To do so, please connect the X-Base again to the X-Control software and click on "parameters". The value of the edit-field designated with "Current:" must be 35. Once you are done click on "Finished" and then on "Transmit and disconnect".

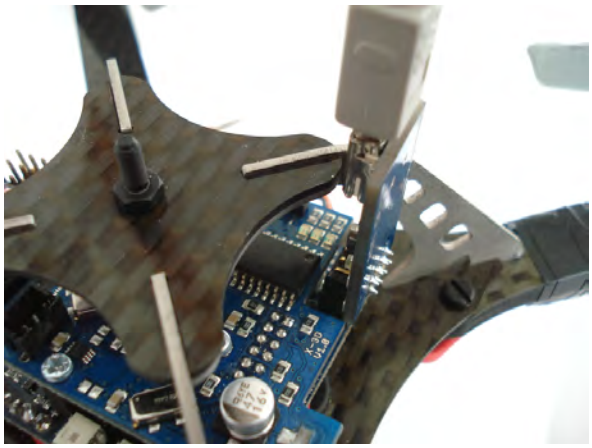
3.2 Configuration

The last steps required before the first flight are the configuration of the X-BLDC brushless motor controllers, teaching in your remote control and uploading suitable controller parameters to the X-3D.

3.2.1 Setting up the X-BLDC brushless motor controllers

The X-Base will not recognize all motors before they have been set up correctly. This is absolutely normal! Not until a successful configuration the X-Base will recognize all X-BLDC controllers and the X-3D-BL UFO will signal "ready to fly".

Connect the battery to the X-3D-BL, turn it on and connect the USB adapter with your computer and then with the X-Base.



Open the X-Control software and click on "X-Base". Choose the correct COM-Port (normally "Autoselect: COMxx") and click on "Connect". Chose "X-BL Setup" and click on "start search". After several seconds four brushless controllers with different serial numbers should appear in the list. If less than four controllers appear, turn of your X-3D-BL, check all solderings and connectors and repeat the previous steps.

If all four controllers have been found, click on "config" and follow the instructions given by the software in order to tell each controller its own position and the appropriate turning direction. After that, click on "Disconnect" to complete the controller setup.

Optionally a startup melody can be installed using the X-BL update function. A detailed description of how to do this can be found in appendix B.

3.2.2 Teach-in of your remote control

Connect the USB adapter to your PC and to the X-Base, turn on your UFO and click on "X-Base" and then on "Connect" in the X-Control software. Then choose "Receiver setup" and "Automatic calibration"and follow the instructions given by the software.

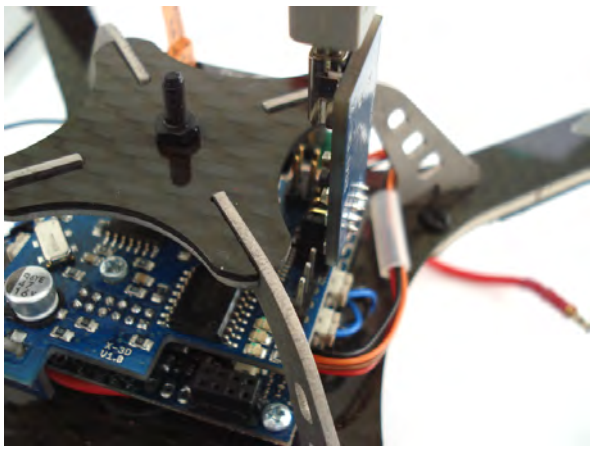
You can freely choose a stick on your R/C for every function. If you are used to a certain configuration you should definitely continue using this one. If you haven't flown other model aircrafts before we recommend the following configuration ("Mode 2"):

The X-3D-BL works with any R/C with at least four channels. Make sure that all channels work independently and that no mixers are active in your remote.

3.2.3 X-3D Parameters

The X-3D offers four preprogrammable parameter sets which can be selected by jumpers. You can find four recommended parameter sets in the software package (.zip-file) you downloaded before in the sub folder "X-3D Settings".

To upload the parameters you have to connect the X-3D with the USB adapter:



In this case it does not matter if the X-3D-BL is turned on or off. Click on "X-3D" in the X-Control software, choose the correct COM-Port (normally "Autoselect: COMxx") and click on "Connect". Then

click on "Parameters".

You can select a parameter set in the upper left corner. The image on the lower left shows the jumper setting which enables the selected setting. Select all four settings (one after another) and for each of them load one of the four recommended parameter sets (e.g. "X-3D for X-Base - Beginner Setting Vx.x.ini") by clicking on "Load".

Click on "Finished" and then on "Transmit and Disconnect" to complete the software configuration of your X-3D-BL.

4 Operation of the X-3D-BL

4.1 Important things to keep in mind

- Directly after turning the X-3D-BL on the motors produce a short beep. It is perfectly normal that the propellers move slightly during that tone.

- Keep the X-3D-BL totally still after turning it on until the X-3D shows the yellow+green (no reception) or green (ready to fly) light pattern. Otherwise the sensors can not be calibrated correctly and the vehicle might go crazy after turning on the motors. If you accidentally moved the system during startup simply turn it off and on again.

- If only the green LED at the X-3D board is on the vehicle is ready to fly. A yellow+green light pattern means "no reception", which is also signalized by a periodic beep of all motors. In this case please check that your remote control is turned on and fully functional, that the receiver crystal is installed in the receiver and that the receiver is connected correctly.

- After the startup phase the motors are still turned off and secured. To turn them on you have to move the yaw stick to the very left or to the very right while your throttle stick is in zero position. The motors will then start and keep running at their minimum speed. Now you can fly as usually. To turn the motors off you have to do the same procedure again: Move the yaw stick to the very left or to the very right while your throttle stick is in zero position. There is no flight maneuver where one would use this control input and thus you will not accidentally turn off your motors during flight. For safety reasons you should turn off the motors immediately if one of the propellers touches the ground or any other obstacle and hence the X-3D-BL is not able to take off.

- There is a battery warning implemented in your X-3D-BL. A low battery is signalized by a periodic, simultaneous tremor of all motors. This is hard to see but it can be heard. Depending on the battery you use there is about a minute of flight time left after the low-battery warning is activated. Lithium Polymer (LiPo) batteries are very vulnerable to deep discharge. That is why the X-3D-BL turns off completely if the voltage drops under a programmable threshold. You can adjust the thresholds for the low-battery warning and the low-battery shut down using the X-Control software. Therefor you have to connect the X-Base to your PC using the USB adapter and click on "X-Base", "Connect" and then on "Parameters".

4.2 First flight

We recommend to wait for a dry and calm day to do the first flight. The best training area is a big field with grass. On the soft ground your X-3D-BL will survive crashes much more likely than if you crash on tar or concrete. Do not fly above tar, concrete or other hard grounds unless you are an experienced X-3D-BL pilot!

Check the functionality of your X-3D-BL before your take off! To do so, you can hold your vehicle by holding the lower part of the X-CSM Core. Make sure you do not touch the blades. Start the motors, move the pitch and roll sticks and see if the vehicle turns into the desired direction. Turn the motors off again after the test was completed successfully.

Now, place the X-3D-BL on a flat ground. Turn on the motors and lift off by pushing the throttle stick up a bit. Attention! the X-3D-BL is extremely powerful! If you give to much throttle it will rise up into the air very fast. However, make sure that the vehicle does not touch the ground any more after you started to push the stick up, because the controllers can only work as intended once the vehicle is airborne. Try to keep the X-3D-BL hovering in a height of about one meter. Make sure that the **front marking** is always **facing away** from you and correct the orientation accordingly using your yaw stick. Only if the front is facing away from you the vehicle will fly in the direction you push the pitch and roll stick. In any other case you have to rotate the helicopter mentally to know where to push the stick for a desired reaction, which requires some practice. If the vehicle continues to yaw in a certain direction without any command you can use the yaw trimmer on your R/C to compensate for that.

Once you know how to hover in a constant height you can start flying a few meters away from you and come back again. After that, you can try to fly to the right and to the left hand side and thereby turn the heading in the direction of travel using the yaw stick. Of course, this requires some practice. With some more practice you're even able to do 3D-maneuvers like loops and flips. Good luck!

Enjoy flying your X-3D-BL UFO!

5 Contact Information

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Support forum: www.xufo.de

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A Troubleshooting

This chapter holds solutions to problems which might occur during the operation of your X-3D-BL UFO.

A.1 The vehicle drifts significantly into a certain direction

Turn the system off and on again and make sure that it is held totally still until the X-3D shows the yellow+green or the green light. If the problem still exists hold the vehicle in your hand (hold the lower part of the X-CSM Core), turn on the motors carefully, give *some* throttle and figure out in which direction it tilts. Move the corresponding trimmer on your R/C in the opposite direction. Repeat this until the drift is very small, that means until the vehicle stays kind of leveled for a few seconds after startup. Now also the take-off should work without any problems.

The vehicle always turns into the same direction, even though the relevant trimmer is at maximum and the vehicle was definitely held still during startup

Is your remote control taught-in correctly? Connect the X-Base to your PC using the USB adapter and open the X-Control software to check if all channels are detected as centered if the sticks on the R/C are centered. If this is not the case repeat the teach-in of your R/C following the instructions given by the software.

A.2 Bad reception during flight

If the X-3D-BL does not react while it is airborne, please check if someone else uses the same channel. Make sure your TX battery is fully charged and that the antenna is fully extended. If you are still having trouble you can to the following test to check the range of your R/C system:

During the range check all other transmitters should be switched off. The best location to do the test is a big open field, as metallic objects like cars or wire fences could influence the result. You need a helper who holds your transmitter with the antenna as close to vertical as possible. Turn the X-3D-BL on and wait until only the green LED on the X-3D is on signalizing "ready to fly". Then walk away from the transmitter until the yellow LED starts flickering. At this point you should be at least 100 m away from your TX. Repeat the whole procedure with the motors running at minimum throttle. If at a distance of about 100 m the signal is still o.k. (i.e. only the green is LED on), your reception is totally fine. Due to the size of the aircraft and the associated visibility you will never fly any further away than that. If the yellow LED comes up randomly at shorter distances your TX/RX combination is to weak. In this case you can try extending the antenna of the X-3D-BL by using a longer plastic tube or stick which holds the antenna. A fully extended antenna works definitely better than one which is wound around a stick as described in this manual. If you use a stub antenna at your TX this could also be the reason for a bad reception, as such antennas do not transmit the full power. In this case try using a standard telescopic antenna instead.

A.3 No reaction on pitch and roll commands during a loop

During your first attempts to fly 3D maneuvers it can happen that your X-3D-BL suddenly stops turning

in pitch and roll even though you push the pitch/roll stick to maximum. In this case throttle is too low (almost zero). The so called heading lock controllers used to stabilize all axes of the X-3D-BL resets the computed angles to zero if throttle is at minimum. This is the only way to get the vehicle to lift off straight after it was standing on the ground or held in your hand. To avoid the problem during the loops simply do not take throttle totally back but always leave a few percent of throttle. After a few tries you will get used to that behavior.

A.4 The red LED on the X-3D keeps blinking after the startup

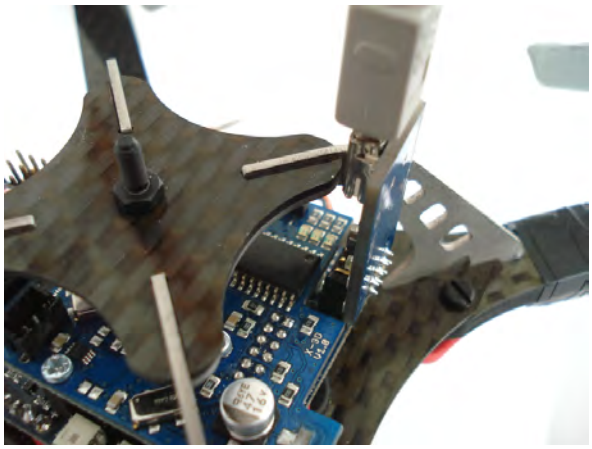
If you have not configured your X-3D-BL using the X-Control software as described above this behavior is normal. In this case please follow the instructions given in 3.2. If the configuration of your vehicle was completed successfully the blinking red LED means that one of the motor controllers or motors was not detected. Please check if all four cables in black and blue color between the X-Base and the motor controllers are connected correctly. If all connections are o.k. please verify that all motors produce a short beep directly after you turn the X-3D-BL on. If one of them does not play the sound check the power connection of the affected motor controller. Are all wires o.k.? Are all soldering points clean and correct? If you connect the X-Base to the X-Control software it will show you which of the motors is not working correctly.

A.5 The X-3D-BL turns itself off during flight

Please make sure that the current limit of your X-Base is set to 35 A. To do so, please connect the X-Base to the X-Control software and click on "parameters". The value of the edit-field designated with "Current:" must be 35. Once you are done click on "Finished" and then on "Transmit and disconnect".

B User-programmable startup melodies

Your X-3D-BL is capable of playing preprogrammed melodies directly after the initialization. To upload a melody please connect the battery to the X-3D-BL, turn it on and connect the USB adapter with your computer and then with the X-Base.



Open the X-Control software and click on "X-Base". Choose the correct COM-Port (normally "Autoselect: COMxx") and click on "Connect". Chose "X-BL Setup" and click on "start search". After several seconds four brushless controllers with different serial numbers should appear in the list. If all four controllers have been found, click on "Firmware upgrade", then on "Select all controllers" and open the "Select firmware" dialog. Select "X-BL Startup melody (.snd)" on the lower right of the window and open any *.snd file you like, for instance from the subdirectory "X-BL Sounds" in the X-3D-BL software package. Then press "Upload".
After the upload is completed click on "Finished" and turn your X-3D-BL off and on again. After initializing it should play the new sound. Enjoy it! :-)